

Decision 23-11-086 November 30, 2023

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Application of Southern California Edison Company (U338E) for Approval of Its 2021-2025 Investment Plan for the Electric Program Investment Charge.

Application 22-10-001

And Related Matters.

Application 22-10-002

Application 22-10-003

DECISION APPROVING THE APPLICATIONS OF SOUTHERN CALIFORNIA EDISON COMPANY, SAN DIEGO GAS & ELECTRIC COMPANY, AND PACIFIC GAS AND ELECTRIC COMPANY FOR THE 2021-2025 ELECTRIC PROGRAM INVESTMENT CHARGE PROGRAM INVESTMENT PLANS

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Appendix A –Modification and Additional Requirements to be Addressed via Tier 2 Advice Letter and/or in Project Implementation Reporting

DECISION APPROVING THE APPLICATIONS OF SOUTHERN CALIFORNIA EDISON COMPANY, SAN DIEGO GAS & ELECTRIC COMPANY, AND PACIFIC GAS AND ELECTRIC COMPANY FOR THE 2021-2025 ELECTRIC PROGRAM INVESTMENT CHARGE INVESTMENT PLANS

Summary

This decision approves Southern California Edison Company's (SCE), San Diego Gas & Electric Company's (SDG&E), and Pacific Gas and Electric Company's (PG&E), (collectively the IOUs), Electric Program Investment Charge Investment Plans for 2021-2025 (EPIC 4 Plans), with modifications.

The IOUs' EPIC 4 Plans and Research Topics are approved subject to modification and additional requirements. The IOUs shall each file a Tier 2 Advice Letter to update their respective EPIC 4 Plans with the modifications discussed in this decision and the additional requirements contained in Appendix A within 45 days after the effective date of this decision. The total budget authorized for the EPIC 4 Plans is \$76.035 million for SCE, \$16.28 million for SDG&E and \$92.685 million for PG&E.

This consolidated proceeding is closed.

1. Background

1.1. Energy Program Investment Charge

The Electric Program Investment Charge (EPIC) is an energy innovation funding program established under the authority of the California Public Utilities Commission (Commission).¹ EPIC seeks to drive efficient, coordinated investment in new and emerging energy solutions. The program's guiding principles are to provide benefits to customers with a focus on improving safety, increasing reliability, increasing affordability, improving environmental

¹ Decision (D.) 11-12-035.

sustainability, and improving equity.² EPIC innovations are funded through the electric Public Purpose Programs bill component, authorized by the Commission. Eighty percent of the total EPIC funding is administered by the California Energy Commission (CEC), with the remaining 20 percent administered by Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E), and Southern California Edison Company (SCE), (collectively the IOUs). EPIC is organized around three program areas, Applied Research and Development, Technology Demonstration and Deployment (TD&D), and Market Facilitation; however, the IOUs only administer TD&D.³

On November 22, 2021, the Commission issued D.21-11-028, authorizing the IOUs to continue in their role as EPIC Program Administrators, along with the CEC. Additionally, the Commission authorized the budgets for the IOUs' portion of EPIC, and directed each IOU to file an EPIC Investment Plan application covering 2021-2025, (EPIC 4 Plan), by October 1, 2022, to show how they would administer those funds.⁴

1.2. Procedural Background

On October 3, 2022, SCE, SDG&E, and PG&E filed Application (A.) 22-10-001, A.22-10-002, and A.22-10-003, respectively, requesting approval of their EPIC 4 Plans.

No protest or response was filed to any of the applications.

On November 29, 2022, the assigned Administrative Law Judge (ALJ) issued a ruling to set the date and time for the joint prehearing conference (PHC), and directed parties to prepare, file and serve PHC statements.

² D.21-11-028, at Ordering Paragraph (OP) 2, at 55, and Appendix A.

³ D.12-05-037 at OP 7.

⁴ D.21-11-028 at OP 7 and OP 8.

On December 8, 2022, the IOUs filed individual PHC statements.

On December 12, 2022, a joint PHC was held to discuss the scope of issues, proceeding schedule and whether consolidation of the three applications would be reasonable.

On December 22, 2022, the assigned ALJ issued a ruling requesting post PHC comments on other potential issues including affordability metrics, Environmental and Social Justice (ESJ) considerations and barriers to contracts involving intellectual property rights.

On January 11, 2023, the IOUs filed individual post PHC comments.

On July 25, 2023, an Assigned Commissioner's Scoping Memo and Ruling (Scoping Memo) was issued to consolidate the applications and set forth the proceeding scope and schedule, as well as other procedural matters.

On August 25, 2023, SCE filed a motion for clarification of the Scoping Memo. Specifically, SCE requests confirmation that the issue of eliminating barriers to executing innovative EPIC projects, including governmental related research partners such as universities and national labs, is within this proceeding's scope.

1.3. Submission Date

The matter was submitted on August 25, 2023.

2. Issues Before the Commission

This decision addresses the issues identified in the Scoping Memo listed below. In approving the IOU EPIC 4 Plans, we will discuss how we have modified the plans as set forth in the applications.

1. Whether the IOU EPIC 4 Plans comply with D.23-04-042, OP 2;
2. Whether the IOU EPIC 4 Plans comply with the Commission's EPIC rules and guidance, including those

adopted in D.12-05-037;⁵ D.13-11-025,⁶ D.15-04-020,⁷
D.18-01-008,⁸ D.18-10-052,⁹ D.21-11-028,¹⁰ and
D.23-04-042;¹¹

3. Whether the IOU EPIC 4 Plans comply with statutes and other relevant rules and requirements governing the EPIC program;
4. Whether the IOU EPIC 4 Plans raise any safety concerns;
5. Whether the IOUs should be permitted to submit a Tier 3 Advice Letter (AL) to request approval to add additional Research Topics to the EPIC 4 Plans;
6. Whether the IOU EPIC 4 Plans have impacts on ESJ communities, including the extent to which the investment plans impact achievement of any of the nine goals of the Commission's ESJ Action Plan;
7. Whether the IOU EPIC 4 Plans should be approved for a period of five years from the effective date of this decision; and

⁵ Phase 2 Decision Establishing Purposes and Governance For Electric Program Investment Charge And Establishing Funding Collections For 2013-2020.

⁶ Decision Addressing Applications Of The California Energy Commission, PG&E, SDG&E and SCE For Approval Of Their Triennial Investment Plans For the Electric Program Investment Charge Program For The Years 2012 Through 2014.

⁷ Decision Addressing Applications Of The California Energy Commission, PG&E, SDG&E and SCE For Approval Of Their Triennial Investment Plans For the Electric Program Investment Charge Program For The Years 2015 Through 2017.

⁸ Decision Addressing Applications Of The California Energy Commission, PG&E, SCE And SDG&E For Approval Of Their Triennial Investment Plans For The Electric Program Investment Charge Program For The Years 2018 Through 2020, And Modifying Decision 12-05-037.

⁹ Decision Addressing Applications of PG&E, SCE and SDG&E for Approval of Their Triennial Investment Plans for Electric Program Investment Charge Program for the Year 2018 through 2020, and Other Programmatic Considerations.

¹⁰ Decision Approving the Utilities as Electric Program Investment Charge Administrators with Additional Administrative Requirements.

¹¹ Decision On Phase 2-C Of Electric Program Investment Charge Rulemaking.

8. Whether the IOU EPIC 4 Plans are reasonable, appropriate, in the interest of electric utility ratepayers, and should be approved.

3. Summary of IOU EPIC 4 Plans

The Commission directed the IOUs to compose areas of strategic investment, called Strategic Objectives, and file their EPIC 4 Plans at the Strategic Initiatives level.¹² Strategic Objectives outline the state policy goals that need to be achieved while the Strategic Initiatives are the core approaches to meeting the goals. The IOUs then proposed Strategic Initiatives and Research Topics to meet their high-level Strategic Objectives.

3.1. SCE'S EPIC 4 Plan

SCE's EPIC 4 Plan is authorized at \$76.035 million.¹³ SCE states that its plan prioritizes advancements toward carbon-neutrality, expands the potential benefits of distributed energy resources (DERs) and creates a grid that is more climate change resilient. Following a joint presentation by the IOUs to the Disadvantaged Communities Advisory Group (DACAG) on August 19, 2022, SCE applied DACAG's equity framework principles and included an equity matrix in its plan. SCE identifies three Strategic Objectives, six Strategic Initiatives and proposes fifteen Research Topics which describe how the Strategic Initiatives will be operationalized. Below is a summary of SCE's EPIC 4 Plan.¹⁴

¹² D.21-11-028, at OP 8 and at 57.

¹³ *Id.* at OP 3 and Appendix B at B3.

¹⁴ A.22-10-001 at 11-52.

**Table 1:
SCE's Proposed EPIC 4 Plan**

Strategic Objective	Strategic Initiative	Funding Request (\$mil)	Research Topic
Create a More Nimble Grid to Maintain Reliability as California Transitions to 100 Percent Clean Energy	T&D Foundational Technologies	\$10.5	1. Adaptive Protection 2. Ultra-low-latency Communications 3. Ubiquitous Situational Awareness
	T&D Situational Capabilities	\$13.3	4. High Capacity Throughput and Protection 5. Seamless Grid Flexibility
Increase the Value Proposition of DERs to Customers on the Grid	Energy Management Foundational Technologies	\$14	6. Localized and Edge Control 7. Inertia Substitution 8. Customer Load Flexibility
	Energy Management Situational Capabilities	\$13.2	9. Energy Buffering 10. Bidirectional Power Flow 11. Islanding and Reconfigurability
Inform California's Transition to an Equitable, Zero-Carbon Energy System that is Climate Resilient and Meets Environmental Goals	Vulnerabilities, Threats, and Hazard Reduction	\$8.4	12. Hardening and Remediation 13. Safety and Work Methods Advancement
	Digital Transformation	\$8.7	14. Data-driven Operations 15. End-to-end Advanced Stimulation and Analytics

3.2. SDG&E’S EPIC 4 Plan

SDG&E’s EPIC 4 Plan is authorized at \$16.28 million.¹⁵ SDG&E states that its plan reduces greenhouse gas emissions and advances carbon neutrality, as well as grid resiliency and reliability. SDG&E states that it incorporated feedback from the DACAG and applied DACAG’s equity framework principles, however SDG&E did not include an equity matrix in its plan. SDG&E identifies two Strategic Objectives, two Strategic Initiatives and proposes six Research Topics which describe how the Strategic Initiatives will be operationalized. Below is a summary of SDG&E’s EPIC 4 Plan.¹⁶

**Table 2:
SDG&E’s Proposed EPIC 4 Plan**

Strategic Objective	Strategic Initiative	Funding (\$mil)	Research Topic
Create a More Nimble Grid to Maintain Reliability as California Transitions to 100 Percent Clean Energy	Grid Modernization	\$7.3	1. Communication and Control Infrastructure for Power System Technology Advancement 2. Mobile Microgrid
Increase the Value Proposition of DERs to Customers on the Grid	DER Integration	\$7.3	3. Optimizing Real-Time Net Energy Metering Hosting Capacity 4. Demonstrating Solutions for Inverter Integration Issues 5. Integrated DER Operational Flexibility 6. Commuter Train Electrification

¹⁵ D.21-11-028, at OP 3 and Appendix B at B2.

¹⁶ A.22-10-002, Attachment A at 8-22.

3.3. PG&E'S EPIC 4 Plan

PG&E's EPIC 4 Plan is authorized at \$92.685 million.¹⁷ PG&E states that its plan prioritizes advancements toward carbon-neutrality, expands the potential benefits of DERs and creates a more climate change resilient grid. PG&E states that it applied DACAG's equity framework principles and included an equity matrix in its plan. PG&E identifies three Strategic Objectives, five Strategic Initiatives and proposes twenty three Research Topics which describe how the Strategic Initiatives will be operationalized. Below is a summary of PG&E's EPIC 4 Plan.¹⁸

¹⁷ D.21-11-028 at OP 3 and Appendix B at B2.

¹⁸ A.22-10-003, Attachment 1 at 19-118.

**Table 3:
PG&E’s Proposed EPIC 4 Investment Plan**

Strategic Objective	Strategic Initiative	Funding Request (\$mil)	Research Topic
Create a More Nimble Grid to Maintain Reliability as California Transitions to 100 Percent Clean Energy	Clean, Dispatchable Resources	\$18	1. Microgrid Enablement 2. Individual Customer Resiliency 3. Long Duration Energy Storage 4. Integration of New Generation Technologies
	Grid Modernization	\$18	5. Grid Sensing and Communication 6. Grid Scenario Planning 7. Advanced Drone Applications 8. Advanced Predictive Maintenance and Failure Cause Analysis 9. Work Management 10. System Protection
Increase the Value Proposition of DERs to Customers on the Grid	DER Integration and Load Flexibility	\$18	11. Interconnection Enablement 12. Advanced Distribution Power Flow Management
	Transportation Electrification	\$11	13. Electric Vehicle Charging and Integration Enablement 14. Electric Vehicle Battery Re-Use for Stationary Energy Storage

Strategic Objective	Strategic Initiative	Funding Request (\$mil)	Research Topic
Inform California's Transition to an Equitable, Zero-Carbon Energy System that is Climate Resilient and Meets Environmental Goals	Climate and Environment	\$18	15. Preventing Faults from Causing Ignitions 16. Undergrounding Capabilities 17. Improved Inspection Capabilities 18. Pinpointing Fault Location 19. Risk Modeling Improvements 20. Crowdsourcing 21. Climate and Nature-Positive Operations 22. Disaster Protection 23. Granular Attributes for Environmental Commodity Tracking

4. EPIC 4 Plan Evaluation

In evaluating the IOU EPIC 4 Plans, the Commission must determine whether the proposed plans are reasonable, appropriate, in compliance with EPIC program rules, and in the interest of electric utility ratepayers. We find that, with limited exceptions, the IOU EPIC 4 Plans comply with EPIC program rules, will benefit ratepayers and are just and reasonable. A limited number of proposed Research Topics, however, require further details and consequent modification to the plans. Below we discuss where we require modification.

4.1. Compliance with D.23-04-042, OP 2

4.1.1. Issue

Scoping Memo issue one asks whether the IOU EPIC 4 Plans comply with D.23-04-042, OP 2. On April 28, 2023, the Commission adopted D.23-04-042,

Decision on Phase 2-C of Electric Program Investment Charge Rulemaking. OP 2 provided the following directive:

Beginning with the Electric Program Investment Charge (EPIC) 4 Investment Plans, EPIC Administrators shall consider the California Public Utilities Commission's (Commission) Environmental and Social Justice Action Plan, the Commission's Distributed Energy Resources Action Plan, and the federal Justice40 Initiative when developing EPIC investment plans. The EPIC 4 Investment Plan shall dedicate at least 25 percent of technology demonstration and deployment (TD&D) funds toward projects located in and benefitting disadvantaged communities and at least an additional 10 percent allocation of TD&D funds toward projects located in and benefitting low-income communities. In their annual reports, EPIC Administrators shall indicate how their investment plans meet the standards set in these initiatives.

4.1.2. Discussion

The requirements of D.23-04-042 were issued on April 28, 2023, and were not in effect when the IOUs filed their EPIC 4 Plans on October 3, 2022. Therefore, the IOU EPIC 4 Plans did not comply with this directive.

To comply with D.23-04-042, the IOUs shall update their respective EPIC 4 Plans via a Tier 2 AL within 45 days after the effective date of this decision and demonstrate how the plans incorporate the Commission's ESJ Action Plan, the Commission's Distributed Energy Resources Action Plan, and the federal Justice40 Initiative. Additionally, in their annual reports, the IOUs shall report and provide details on how they have allocated at least 25 percent of TD&D funds towards projects located in and benefitting disadvantaged communities and at least an additional 10 percent allocation of TD&D funds towards projects located in and benefitting low-income communities.

4.2. Compliance with EPIC Rules and Guidance, and other Commission Decisions

4.2.1. Issue

Scoping Memo issue two asks whether the IOU EPIC 4 Plans comply with current EPIC program rules and guidance, and other Commission decisions. This includes compliance with the following directives:

- **Budget:** D.21-11-028, OP 3 requires that for EPIC 4, PG&E shall have an annual EPIC budget of \$18.444 million, SDG&E shall have an annual EPIC budget of \$3.24 million, and SCE shall have an annual EPIC budget of \$15.131 million.
- **Administrative Costs:** D.12-05-037, OP 5 sets a cap of 10 percent of the budget for administrative costs for IOU Program Administrators. D.21-11-028, OP 16 requires that the EPIC Program Administrators provide a detailed line-item list of eligible administrative budget line items via a file a joint Tier 2 AL and identify and describe areas in which EPIC Program Administrators could not come to consensus.
- **Budget Planning Level:** D.21-11-028, OP 8 requires that EPIC Program Administrators file investment plans at the Strategic Initiative level, propose funding levels for the Strategic Initiatives, and specify how these initiatives will be operationalized, including the proposed activities.
- **Ratepayer Benefit:** Consistent with the mandatory guiding principle of EPIC as defined in D.12-05-037 and modified in D.21-11-026, every proposed EPIC activity must provide clear ratepayer benefits.
- **Equity:** D.21-11-021, Attachment A provides mandatory guidance that EPIC innovations should increasingly support, benefit, and engage disadvantaged vulnerable California communities (DVCs).
- **Efficient Use of Ratepayer Monies:** D.12-05-037 states that EPIC funding should not be used to support activities or efforts that are duplicative of efforts that are being

undertaken elsewhere or that are more expensive than necessary to achieve the goals.

- **Coordination with Commission Proceedings:** D.18-01-008 established the Policy and Innovation Coordination Group (PICG), composed of the Commission, EPIC Program Administrators, and a project coordinator as an ongoing venue for cooperation and communication within EPIC. The PICG was envisioned to conduct specific coordination functions to ensure that EPIC investments are optimally aligned with and informed by key Commission and California energy innovation needs and goals. Such coordination between EPIC projects and Commission proceedings was intended to inform the development of the IOUs' EPIC 4 Plans.

4.2.2. Discussion

Overall, we find that the IOU EPIC 4 Plans comply with the Commission's EPIC rules and guidance, with limited exceptions, as discussed below. For those areas where we find that the Research Topics require more details, the IOUs shall update their respective plans via a Tier 2 AL within 45 days after the effective date of this decision, or through additional reporting, as specified in Appendix A.

4.2.2.1. SCE

We find that SCE's EPIC 4 Plan generally complies with current rules and guidance including those related to budget, administrative costs, budget planning level, ratepayer benefits, and coordination with Commission proceedings. However, for some of the Research Topics, we find that additional details are needed to ensure that these projects increasingly support, benefit, and engage DVCs, or meet the requirements of equity and efficient use of ratepayer funds. Appendix A lists the additional information required by Research Topic.

We approve SCE's EPIC 4 Plan and Research Topics, and require SCE to submit updated plans with the additional requirements via a Tier 2 AL within 45 days after the effective date of this decision, or through additional reporting as specified in Appendix A.

4.2.2.2. SDG&E

We find that SDGE's EPIC 4 Plan generally complies with current rules and guidance including those related to budget, administrative costs, budget planning level, ratepayer benefits, and coordination with Commission proceedings, with the exception of Research Topic 6. We find that SDG&E's Research Topic 6, Commuter Train Electrification, falls outside the scope of EPIC because it proposes an already commercially available technology. D.12-05-037 defined TD&D in part as the installation and operation of pre-commercial technologies or strategies.¹⁹ Because battery-powered electric locomotives are already commercially available, Research Topic 6 is not considered a TD&D project, and is therefore denied. Also, for some of the other Research Topics, we find that additional details are needed to ensure that these projects increasingly support, benefit, and engage DVCs, or meet the requirements of equity and efficient use of ratepayer funds. Appendix A lists the additional information required by Research Topic.

We approve SDGE's EPIC 4 Plan and Research Topics, with the exception of Research Topic 6, and require SDG&E to submit updated plans with the additional requirements via a Tier 2 AL within 45 days after the effective date of this decision, or through additional reporting, as specified in Appendix A. SDG&E shall also include in its AL how it will reallocate the funds originally

¹⁹ D.12-05-037 at OP 3(b).

proposed for Research Topic 6 to other Research Topics within its EPIC 4 Plan, along with the need and justification of such costs.

4.2.2.3. PG&E

We find that PG&E's EPIC 4 Plan generally complies with current rules and guidance including those related to budget, administrative costs, budget planning level, ratepayer benefits, and coordination with Commission proceedings, with the exception of Research Topic 21. We find that the direct air carbon capture portion of Research Topic 21 is duplicative of federal efforts, and is therefore denied. The Infrastructure Investment Jobs Act includes \$18.9 billion in funding for carbon management infrastructure, including \$3.615 billion specifically for direct air carbon capture, making the direct air carbon capture portion of Research Topic 21 duplicative and unnecessary. Additionally, for some of the other Research Topics, we find that additional details are needed to ensure that these projects increasingly support, benefit, and engage DVCs, or meet the requirements of equity and efficient use of ratepayer funds. Appendix A lists the additional information required by Research Topic.

We approve PG&E's EPIC 4 Plan and Research Topics, with the exception of the direct air carbon capture portion of Research Topic 21, and require PG&E to submit updated plans with the additional requirements via a Tier 2 AL within 45 days after the effective date of this decision, or through additional reporting, as specified in Appendix A. PG&E shall also include in its AL how it will reallocate all funds intended for investigation and demonstration of direct air carbon capture to other Research Topics within its EPIC 4 Plan, along with the need and justification of such costs. PG&E shall explain in its AL how investment in demonstrating use of carbon credits related to vegetation management and biomass conversion would result in credits that are rigorously

demonstrable as real, verified, enforceable, permeant, additional, and robust against leakage. Additionally, consistent with the requirements of D.20-08-042 in reducing its carbon emissions, PG&E shall ensure net emissions of criteria pollutants do not increase within any airshed as a result of EPIC funded innovation in vegetation management and biomass conversion.

4.3. Compliance with Statute and other Relevant EPIC Rules and Guidance

4.3.1. Issue

Scoping Memo issue three asks whether the IOU EPIC 4 Plans comply with statute and other relevant rules and requirements governing the EPIC program. This includes compliance with the following statutes:

- **Public Utilities (Pub. Util.) Code § 399.8:** Allows the Commission to create policies and regulations pertaining to energy efficiency, renewable energy, and research and development and demonstration.
- **Pub. Util. Code § 740.1:** Requires the Commission, when evaluating the research, development and demonstrations programs proposed by electrical and gas corporations, to consider whether various factors, including but not limited to whether they: 1) offer a reasonable probability of providing benefits to ratepayers; 2) minimize expenditures on projects that may have a low probability for success; 3) are consistent with the corporation's resource plan; 4) are not unnecessarily duplicative of research currently, previously, or imminently undertaken by other electrical or gas corporations or research organizations; and 5) support various objectives such as environmental improvement, public safety, conservation of efficient resources, development of new resources and processes, and improvement of operating efficiency and reliability or otherwise reduce operating costs.
- **Pub. Util. Code § 8360:** Articulates the state's "smart grid" policy to modernize the electrical transmission and

distribution system to maintain safe, reliable, efficient, and secure electrical service, with infrastructure that can meet future growth in demand and achieve all of the following: 1) dynamic optimization of grid operations and resources, including appropriate consideration for asset management and utilization of related grid operations and resources, with cost-effective full cyber security; 2) deployment and integration of cost-effective distributed resources and generation, including renewable resources; 3) development and incorporation of cost-effective demand response, demand-side resources, and energy-efficient resources; 4) deployment of cost-effective smart technologies, including real time, automated, interactive technologies that optimize the physical operation of appliances and consumer devices for metering, communications concerning grid operations and status, and distribution automation; 5) integration of cost-effective smart appliances and consumer devices; 6) deployment and integration of cost-effective advanced electricity storage and peak-shaving technologies, including plug-in electric and hybrid electric vehicles, and thermal-storage air-conditioning; 7) provides consumers with timely information and control options; 8) develops standards for communication and interoperability of appliances and equipment connected to the electric grid, including the infrastructure serving the grid; and 9) identifies and lowers unreasonable or unnecessary barriers to adoption of smart grid technologies, practices, and services.

4.3.2. Discussion

Overall, we find that the IOU EPIC 4 Plans comply with the above statutes, with limited exceptions, as discussed in section 4.2.2. For those Research Topics where we find that additional details are needed, the IOUs shall submit updated plans with the additional requirements via a Tier 2 AL within 45 days after the effective date of this decision, or through additional reporting, as specified in Appendix A.

4.4. Safety

4.4.1. Issue

Scoping Memo issue four asks whether the IOU EPIC 4 Plans raise any safety concerns. This includes compliance with Pub. Util. Code § 8360, where it is the policy of the state to modernize the state's electrical transmission and distribution system to maintain safe, reliable, efficient, and secure electrical service, with infrastructure that can meet future growth in demand and achieve a smart grid.

4.4.2. Discussion

Upon review of the IOU EPIC 4 Plans, we find that they do not pose any safety concerns at this time.

4.5. IOUs' Request for Approval to Add Additional Research Topics to the EPIC 4 Plans via a Tier 3 AL

4.5.1. Issue

Scoping Memo issue five asks whether the Commission should approve the IOUs' request for authorization to file Tier 3 ALs to request approval to add any additional Research Topics to the EPIC 4 Plans that are already approved.²⁰

SCE states that the EPIC 4 Plans should be flexible and include emergent operational opportunities, and that how the IOUs operationalize an approved opportunity and/or challenge would not constitute a material change as it would not affect the existing Strategic Objectives or Strategic Initiatives.²¹

²⁰ A.22-10-001 at 2, A.22-10-002 at 11, and A.22-10-003 at 4.

²¹ SCE Opening Comments on Proposed Decision Approving the Applications of SCE, SDG&E, and PG&E for the 2021-2025 EPIC 4 Plans at 5.

4.5.2. Discussion

The Commission agrees with SCE that the EPIC 4 Plans should have the flexibility to include emergent operational opportunities and approve the IOUs' request, with modifications. Given the time remaining to commit the EPIC 4 funding, the IOUs may file a Tier 2 AL to request approval to add any additional Research Topics to the EPIC 4 Plans, rather than a Tier 3 AL. The Tier 2 AL must include the following: 1) a demonstration that the proposed Research Topic(s) is/are consistent with the Commission's approved IOU Strategic Initiatives as well as guidance in this decision and D.23-04-042 including that it will support California's 2045 climate, clean energy, and equity goals; 2) a detailed description of the proposed Research Topic(s); 3) an explanation of how the Research Topic(s) will impact / modify the approved EPIC Investment Plan; 4) a demonstration that the Research Topic(s) provide(s) ratepayer benefits; and 5) an explanation of why the Research Topic(s) is/are necessary to be addressed mid-cycle.

4.6. Environmental and Social Justice

4.6.1. Issue

Scoping Memo issue six asks whether the IOU EPIC 4 Plans have impacts on ESJ communities, including the extent to which the investment plans impact achievement of any of the nine goals of the Commission's ESJ Action Plan. The Commission's ESJ Action Plan serves as a roadmap for implementing the Commission's vision to advance equity in its programs and policies for ESJ or disadvantaged communities.²² The ESJ Action Plan includes goals related to

²² The ESJ Action Plan was approved February 21, 2019, in Commission Public Agenda 3433 at Item # 44 [17051]. Version 2.0 of the ESJ Action Plan was approved April 27, 2022, in Commission Public Agenda 3505 at Item # 45 [20479]. The Commission adopted Version 2 of the ESJ Action Plan on April 7, 2022.

health and safety, consumer protection, program benefits, and enforcement in sectors regulated by the Commission.

4.6.2. Discussion

4.6.2.1. SCE

We find that SCE' EPIC 4 Plan does not demonstrate alignment with the Commission's ESJ goals. SCE provides a number of Research Topics which they claim benefit DVCs and provided an equity matrix based on the DACAG Equity Framework. However, only two Research Topic descriptions mention DVCs as direct beneficiaries, and neither provides a specific plan of action or engagement.²³ According to SCE's EPIC 4 Plan application, the DACAG encouraged the IOUs to review their guiding principles to determine whether they would be applicable to the IOUs' EPIC 4 Plan.²⁴ Additionally, none of the initiatives or Research Topic under SCE's Strategic Objective to *Increase the Value Proposition of Distributed Energy Resources to Customers and the Grid* prioritize deployment in DVCs.

To better promote and support the Commission's ESJ goals, SCE shall update its EPIC 4 Plan via a Tier 2 AL within 45 days after the effective date of this decision, to include:

- A revised equity matrix including only Research Topics that have direct impacts on DVCs that can be substantiated with clear justification in the corresponding Research Topic narratives;
- Details for each applicable Research Topic on how positive impacts on DVCs would be achieved, and/or the likely barriers to their realization; and

²³ A.22-10-001, Research Topic Area: *Islanding & Reconfigurability* at 41-42. Research Topic Area: *Hardening and Remediation* at 44-45.

²⁴ A.22-10-001 at C-1.

- A plan for how it will coordinate with the Commission and the CEC on DER-related efforts to prioritize deployment in DVCs or explain why this is not necessary.

4.6.2.2. SDG&E

We find that SDGE's EPIC 4 Plan does not demonstrate alignment with the Commission's ESJ goals. None of SDG&E's initiatives or Research Topics under the Strategic Objective to *Increase the Value Proposition of Distributed Energy Resources to Customers and the Grid* prioritize deployment of DVCs.

To better promote and support the Commission's ESJ goals, SDG&E shall update its EPIC 4 Plan via a Tier 2 AL within 45 days after the effective date of this decision, to include:

- An equity matrix based on the DACAG Equity Framework identifying Research Topics expected to have verifiable direct impacts on DVCs;
- Details for each applicable Research Topic on how positive impacts on DVCs would be achieved, and/or the likely barriers to their realization;
- A specific plan to operationalize the DACAG equity framework and improve coordination with DVCs; and
- A plan for how it will coordinate with the Commission and the CEC on DER-related efforts to prioritize deployment in DVCs or explain why this is not necessary.

4.6.2.3. PG&E

We find that PG&E's EPIC 4 Plan does not demonstrate alignment with the Commission's ESJ goals. PG&E's EPIC 4 Plan claims to provide potential benefits for DVCs and provided an equity matrix based on the DACAG Equity Framework. However, the claims do not appear to be based on specific analysis and planning. PG&E does not explain how such benefits would be achieved, and/or the barriers involved to their realization. While PG&E claims that a

majority of the Research Topics provide direct DVC benefits, only ten list DVCs as direct beneficiaries, and only one contains a specific plan.²⁵

To better promote and support the Commission's ESJ goals, PG&E shall update its EPIC 4 Plan via a Tier 2 AL within 45 days after the effective date of this decision, to include:

- Additional information on its Community Perspectives Advisory Council and how it will demonstrate improved DVC/Community Based Organization participation in its workshops;
- A revised equity matrix including only Research Topics that have direct impacts on DVCs that can be substantiated with clear justification in the corresponding Research Topic narratives; and
- Details for each applicable Research Topic on how positive impacts on DVCs would be achieved, and/or the likely barriers to their realization.

4.7. Funding Period for EPIC 4

4.7.1. Issue

Scoping Memo issue seven asks whether the IOU EPIC 4 Plans should be approved for a period of five years from the effective date of this decision. In its application, PG&E requests that the IOUs be authorized to fund their EPIC 4 projects for a full five years from the effective date of the decision claiming that this would allow for more effective project sequencing which would enable progressive maturation of technologies and solutions otherwise limited by a shorter funding authorization.²⁶

²⁵ A.22-10-003 Table 2: EPIC 4 Equity Matrix at 15-16.

²⁶ *Id.* at 126.

4.7.2. Discussion

We deny PG&E's request to extend the EPIC 4 funding cycle beyond 2025. We are not persuaded by PG&E's argument that the shorter funding period will negatively impact project sequencing. We maintain the years designated for the EPIC 4 cycle (2021-2025), and confirm that all EPIC 4 funds must be committed by Dec 31, 2025, when the EPIC 4 cycle ends. This will keep the IOUs and CEC's EPIC 4 cycles aligned, and avoid any crossovers with potential future EPIC cycles.

We are confident that the IOUs can commit these funds before the cycle ends on Dec 31, 2025. As defined in D.13-11-025, committed funds are "funds identified during the planning of a solicitation for a specific project that will be needed to fund a contract or grant for that project at the conclusion of a planned or released solicitation."²⁷ We broaden this definition to include funds needed for funding agreements, such as cooperative agreements with federal and state partners and internal agreements for IOU led projects.

We clarify that even though all EPIC 4 funds must be committed by Dec 31, 2025, expenditures on EPIC 4 projects may extend beyond 2025, so long as they have been previously committed within the EPIC 4 period. The treatment of any uncommitted and unspent funds shall remain consistent with existing EPIC program funding rules, unless otherwise specified in R.19-10-005. The IOUs may begin committing, encumbering, and spending EPIC 4 funds upon the effective date of this decision.

²⁷ D.12-11-025 at 101.

5. SCE Motion

5.1. Issue

On August 25, 2023, SCE filed a motion for clarification of the Scoping Memo requesting confirmation that the issue of eliminating barriers to executing innovative EPIC projects, including governmental related research partners such as universities and national labs, is within this proceeding's scope.

5.2. Discussion

We confirm that the above issue is not addressed in this proceeding as Rulemaking (R.) 19-10-005, *Order Instituting Rulemaking on the Commission's Own Motion to consider renewal of the Electric Program Investment Charge Program*, will address the issue.²⁸

6. Summary of Public Comment

The Commission Rules of Practice and Procedure (Rule) 1.18 allows any member of the public to submit written comment in any Commission proceeding using the "Public Comment" tab of the online Docket Card for that proceeding on the Commission's website. Rule 1.18(b) requires that relevant written comments submitted in a proceeding be summarized in the final decision issued in that proceeding.

No comments were posted under the public comment tab A.22-10-001, A.22-10-002, or A.22-10-003.

7. Conclusion

We approve the IOU EPIC 4 Plans, with modifications, as discussed below and further detailed in Appendix A:

- SCE's EPIC 4 Plan is approved, with modifications, at \$76.035 million. SCE may begin committing, encumbering,

²⁸ D.23-04-042 at 40 and OP 10.

and spending its EPIC 4 funds upon the effective date of this decision.

- SDGE's EPIC 4 Plan is approved, with modifications, at \$16.28 million. SDG&E may begin committing, encumbering, and spending its EPIC 4 funds upon the effective date of this decision.
- PG&E's EPIC 4 Plan is approved, with modifications, at \$92.685 million. PG&E may begin committing, encumbering, and spending its EPIC 4 funds upon the effective date of this decision.
- The IOUs shall each file a Tier 2 AL updating their respective EPIC 4 Plans with the requirements discussed in this decision and per Appendix A, within 45 days after the effective date of this decision. Each AL shall include a table summary explaining the modifications as a roadmap to how the IOU is compliant with the Commission's orders that directly correlates to Appendix A. The IOUs shall submit both a track-change version of their EPIC 4 Plans as well as a clean version. In submitting updated plans, the IOUs may withdraw Research Topics approved in this decision that are no longer priorities for execution.
- SDG&E Research Topic 6 is denied: Commuter Train Electrification. SDG&E shall file in its Tier 2 AL updating its EPIC 4 Plan an explanation of how these funds will be reallocated to other eligible activities within its EPIC 4 Plan along with the need and justification of such costs.
- PG&E Research Topic 21 related to the direct air carbon capture portion is denied: Climate and Nature-Positive Operations. PG&E shall file in its Tier 2 AL updating its EPIC 4 Plan an explanation of how these funds will be reallocated to other eligible activities within its EPIC 4 Plan along with the need and justification of such costs.
- The IOUs may file a Tier 2 AL to request approval to add additional topics to the EPIC 4 Plans.
- PG&E's request to fund the IOUs EPIC 4 projects for a full five years from the effective date of this decision is denied.

8. Procedural Issues

This decision affirms all rulings made by the Administrative Law Judge and assigned Commissioner in this proceeding. All motions not ruled on are deemed denied.

9. Comments on Proposed Decision

The proposed decision of Administrative Law Judge Ava N. Tran in this matter was mailed to the parties in accordance with Section 311 of the Pub. Util. Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments were filed on November 9, 2023 by PG&E and SCE. Reply comments were filed on November 14, 2023 by SDG&E. In response to comments, we make the following clarifications and changes:

- Clarification that the IOUs may begin committing, encumbering, and spending EPIC 4 funds upon the effective date of this decision;²⁹
- Modification to allow the IOUs to file Tier 2 ALs to request approval to add Research Topics to the EPIC 4 Plans;
- Clarification that the IOUs may withdraw Research Topics approved in this decision that are no longer priorities for execution in the Tier 2 AL updating their respective EPIC 4 Plans;
- Various edits to Appendix A to distinguish between requirements that shall be addressed in the IOUs' respective Tier 2 AL, versus requirements that shall be addressed in the future execution of the Research Topics; and

²⁹ PG&E Opening Comment on Proposed Decision Approving the Applications of SCE, SDG&E, and PG&E for the 2021-2025 EPIC 4 Plans at 2-3, SCE Opening Comment on Proposed Decision Approving the Applications of SCE, SDG&E, and PG&E for the 2021-2025 EPIC 4 Plans at 2-4, SDG&E Reply Comments on Proposed Decision Approving the Applications of SCE, SDG&E, and PG&E for the 2021-2025 EPIC 4 Plans at 1-2.

- Corrections to various non-substantive typographical errors, omissions, and ambiguities throughout the document.

10. Assignment of Proceeding

Genevieve Shiroma is the assigned Commissioner and Ava N. Tran is the assigned Administrative Law Judge in this consolidated proceeding.

Findings of Fact

1. SCE, SDG&E and PG&E filed their respective EPIC 4 Plans on October 3, 2022.

2. None of the applications received a protest or response.

3. Each EPIC 4 Plan includes Strategic Objectives at a high level, Strategic Initiative which are the core approaches to meeting the goals at the higher-level Strategic Objective, and proposed Research Topics.

4. The current applicable EPIC program rules, guidance and statutes that inform the EPIC 4 Plans include D.12-05-037, D.13-11-025, D.15-04-020, D.18-01-008, D.18-10-052, D.21-11-028, D.23-04-042, Pub. Util. Code § 399.8, § 740.1, and § 8360.

5. The IOU EPIC 4 Plans generally comply with the EPIC program rules, guidance, and statutes, with limited exceptions.

6. SDG&E's EPIC 4 Plan, Research Topic 6, *Commuter Train Electrification*, focuses on battery-powered electric locomotives which is already commercially available, is outside the scope of EPIC and is duplicative of other previous and current demonstrations.

7. PG&E's EPIC 4 Plan, Research Topic Area 21 related to the direct air carbon capture portion, *Climate and Nature-Positive Operations*, is duplicative of federal efforts as the Infrastructure Investment Jobs Act includes \$3.615 billion specifically for direct air carbon capture.

8. The IOU EPIC 4 Plans do not pose any safety concerns at this time.
9. The Commission's Tier 2 AL process provides flexibility for the IOUs to include emergent operational opportunities and propose additional Research Topics to the EPIC 4 Plans.
10. The IOUs' EPIC 4 Plans do not demonstrate alignment with the Commission's ESJ Action Plan.
11. The IOUs' EPIC 4 funding cycle is aligned with the CEC's EPIC 4 funding cycle, and ends on December 31, 2025.

Conclusions of Law

1. The IOU EPIC 4 Plans are reasonable, generally comply with the EPIC program rules, guidance, and statutes, and should be approved with the modifications discussed in this decision and per Appendix A.
2. SDG&E's EPIC 4 Plan, Research Topic 6, Commuter Train Electrification, should be denied.
3. PG&E's EPIC 4 Plan, Research Topic 21 related to the direct air carbon capture portion, Climate and Nature-Positive Operations, should be denied.
4. It is reasonable to require the IOUs to file updated EPIC 4 Plans via a Tier 2 AL with the additional requirements discussed in this decision and per Appendix A within 45 days after the effective date of this decision.
5. It is reasonable to allow the IOUs to file Tier 2 ALs to propose additional Research Topics to the EPIC 4 Plans.
6. PG&E's request to extend the EPIC 4 funding cycle beyond 2025 is unnecessary and should be denied.

O R D E R

IT IS ORDERED that:

1. Southern California Edison Company's Electric Program Investment Charge Investment Plan Application for 2021 to 2025, is approved at \$76.035 million, with the modifications discussed in this decision and per Appendix A.

2. Southern California Edison Company shall file a Tier 2 Advice Letter within 45 days after the effective date of this decision to update its Electric Program Investment Charge Investment Plan for 2021 to 2025 to:

- a. Demonstrate the alignment between specific Research Topics in its plan and the Commission's Environmental Social Justice Action Plan, the Commission's Distributed Energy Resources (DER) Action Plan, and the federal Justice40 Initiative;
- b. Incorporate the modifications and additional requirements specified in Appendix A; and
- c. Include i) a revised equity matrix including only Research Topics that have direct impacts on disadvantaged vulnerable California communities (DVCs) that can be substantiated with clear justification in the corresponding Research Topic narratives, ii) details for each applicable Research Topic on how positive impacts on DVCs would be achieved, and/or the likely barriers to their realization, and iii) a plan for how it will coordinate with the Commission and the California Energy Commission on

DER-related efforts to prioritize deployment in DVCs or explain why this is not necessary.

3. San Diego Gas & Electric Company's Electric Program Investment Charge Investment Plan Application for 2021 to 2025 is approved at \$16.28 million, with the modifications discussed in this decision and per Appendix A.

4. San Diego Gas & Electric shall file a Tier 2 Advice Letter within 45 days after the effective date of this decision to update its Electric Program Investment Charge Investment Plan for 2021 to 2025 to:

- a. Demonstrate the alignment between specific Research Topics in its plan and the Commission's Environmental Social Justice Action Plan, the Commission's Distributed Energy Resources (DER) Action Plan, and the federal Justice40 Initiative;
- b. Incorporate the modifications and additional requirements specified in Appendix A; and
- c. Include i) an equity matrix based on the Disadvantaged Communities Advisory Group (DACAG) equity framework identifying Research Topics expected to have verifiable direct impacts on disadvantaged vulnerable California communities (DVCs), ii) details for each applicable Research Topic on how positive impacts on DVCs would be achieved, and/or the likely barriers to their realization, iii) a specific plan to operationalize the DACAG equity framework and improve coordination with DVCs, and iv) a plan for how it will coordinate with the Commission and the California Energy Commission on

DER-related efforts to prioritize deployment in DVCs or explain why this is not necessary.

5. Pacific Gas and Electric Company's Electric Program Investment Charge Investment Plan Application for 2021 to 2025 is approved at \$92.685 million, with the modifications discussed in this decision and per Appendix A.

6. Pacific Gas and Electric Company shall file a Tier 2 Advice Letter within 45 days after the effective date of this decision to update its Electric Program Investment Charge Investment Plan for 2021 to 2025 to:

- a. Demonstrate the alignment between specific Research Topics in its plan and the Commission's Environmental Social Justice Action Plan, the Commission's Distributed Energy Resources (DER) Action Plan, and the federal Justice40 Initiative;
- b. Incorporate the modifications and additional requirements specified in Appendix A; and
- c. Include i) additional information on its Community Perspectives Advisory Council and how it will demonstrate improved disadvantaged vulnerable California communities (DVCs)/Community Based Organization participation in its workshops, ii) a revised equity matrix including only Research Topics that have direct impacts on DVCs that can be substantiated with clear justification in the corresponding Research Topic narratives, and iii) details for each applicable Research Topic on how positive impacts on DVCs would be achieved, and/or the likely barriers to their realization.

7. Southern California Edison Company shall file a Tier 2 Advice Letter in order to propose additional Research Topics to its Electric Program Investment Charge Investment Plan for 2021 to 2025.

8. San Diego Gas & Electric shall file a Tier 2 Advice Letter in order to propose additional Research Topics to its Electric Program Investment Charge Investment Plan for 2021 to 2025.

9. Pacific Gas and Electric Company shall file a Tier 2 Advice Letter in order to propose additional Research Topics to its Electric Program Investment Charge Investment Plan for 2021 to 2025.

10. All other requests not specifically approved in this decision are hereby denied.

11. Application (A.) 22-10-001, A.22-10-002, and A.22-10-003 are closed.

This order is effective today.

Dated November 30, 2023, at Sacramento, California.

ALICE REYNOLDS
President
GENEVIEVE SHIROMA
DARCIE L. HOUCK
JOHN REYNOLDS
KAREN DOUGLAS
Commissioners

APPENDIX A

Modification and Additional Requirements to be
Addressed via Tier 2 Advice Letter and/or in Project
Implementation Reporting

**Appendix A:
Modification and Additional Requirements to be
Addressed via Tier 2 Advice Letter and/or in Project Implementation
Reporting**

Administrator	Research Topic Area Title	Modifications, Requirements, and Directions to be included in the Tier 2 Advice Letter ³⁰ and/or in Project Implementation
SCE	1. Adaptive Protection	SCE shall demonstrate how, in its implementation of this topic, it has considered centralized training for system operators and protection engineers.
SCE	2. Ultra-Low-latency Communications	SCE shall demonstrate how, in its implementation of this topic, it will ensure sufficient cellular network backup power in PSPS or other power outage situations.
SCE	3. Ubiquitous Situational Awareness	SCE shall demonstrate how, in its implementation of this topic, it has considered how its projects may be relevant to climate adaptation.
SCE	4. High-Capacity Throughput and Protection	SCE shall demonstrate how, in its implementation of this topic, this is not duplicative of Research Topic 1 regarding demonstrating dynamic control and use of flexible, software-based protection relays that adapt quickly to evolving grid needs. Additionally, SCE shall explain in its Tier 2 AL how this topic is coordinated and/or informed by PG&E's EPIC 4 Research Topic 10, "System Protection."
SCE	5. Seamless Grid Flexibility	SCE shall demonstrate how, in its implementation of this topic, this is not duplicative of Research Topic 1 regarding demonstration of software and machine learning algorithm results. Additionally, SCE shall explain in its Tier 2 AL how this topic is coordinated and/or informed by SCE's EPIC 3 Storage Based Distribution DC Link project as may be appropriate.
SCE	6. Localized and Edge Control	SCE shall explain in its Tier 2 AL how this topic on adaptive control requirements set here relates to SCE Research Topic 1, Adaptive Protection.

³⁰ Requirements in the Appendix A column entitled *Modifications, Requirements, and Directions* specifying "in its implementation of this topic" are to be conducted during project execution and documented in project reporting. Requirements indicating "in its Tier 2 AL," are to be addressed in the Tier 2 AL.

Administrator	Research Topic Area Title	Modifications, Requirements, and Directions to be included in the Tier 2 Advice Letter ³⁰ and/or in Project Implementation
SCE	7. Inertia Substitution	SCE shall explain in its Tier 2 AL how this topic is aligned with other SCE activities. Additionally, SCE shall demonstrate, in its implementation of this topic, how/whether it has coordinated with PG&E and SDG&E activities to maximize the impact and usefulness of this investment.
SCE	8. Customer Load Flexibility	SCE shall explain in its Tier 2 AL how innovations in solid state transformers will provide insight and benefit beyond existing knowledge. Additionally, SCE shall explain in its Tier 2 AL how cybersecurity efforts complement existing funding and analysis related to increased deployment of networked electric vehicle supply equipment (EVSE) authorized by D.22-11-040.
SCE	9. Bidirectional Power Flow	SCE shall explain in its Tier 2 AL how this topic is cost-effective and well-quantified to demonstrate that the project is an effective use of ratepayer dollars.
SCE	10. Islanding & Reconfigurability	SCE shall explain in its Tier 2 AL how this topic's projects on non-islanded operation are not duplicative of, and are coordinated with as appropriate, other grid modernization efforts including other EPIC projects.
SCE	11. Hardening and Remediation	SCE shall explain in its Tier 2 AL how this topic is not duplicative of activities within SCE's Wildfire Mitigation Plan. Additionally, SCE shall explain in its Tier 2 AL how the new sensing and detection technology for identifying potential grid faults before they occur is distinct from the currently operational "fast curve" setting SCE uses to prevent wildfires.
SCE	12. Safety and Work Methods Advancement	SCE shall explain in its Tier 2 AL how projects under this topic are not duplicative of other SCE, PG&E, and SDG&E research or programs. Additionally, SCE shall explain in its Tier 2 AL how it will coordinate with similar IOU activities as applicable.
SCE	13. Data-driven Operations	SCE shall demonstrate how, in its implementation of this topic, the metrics and performance indicators are well-quantified to ensure that the project is an effective use of ratepayer funds.
SCE	14. End-to-end Advanced Simulations and Analytics	SCE shall demonstrate how, in its implementation of this topic, its projects are coordinated with projects under SCE Research Topic 14, Data-Driven Operations. Additionally, SCE shall consider the value of incorporating equity information in the data layers to inform future grid planning needs.

Administrator	Research Topic Area Title	Modifications, Requirements, and Directions to be included in the Tier 2 Advice Letter³⁰ and/or in Project Implementation
SDG&E	1. Communication and Control Infrastructure for Power System Technology Advancement	SDG&E shall demonstrate how, in its implementation of this topic, its projects are not duplicative of the body of work performed internationally on this topic. Additionally, SDG&E shall demonstrate how, in its implementation of this topic, the metrics and performance indicators are well-quantified to ensure that the project is an effective use of ratepayer funds.
SDG&E	2. Mobile Microgrid	SDG&E shall demonstrate how, in its implementation of this topic, its projects include in their metrics and performance indicators comparison to the value of other temporary resource alternatives.
SDG&E	3. Optimizing Real-Time Net Energy Metering Hosting Capacity	SDG&E shall demonstrate that, in its implementation of this topic, it has considered whether a centralized control scheme is preferred over a distributed automated control scheme using machine learning such as those PG&E and SCE are pursuing, particularly given high-volume data transfer needs. Additionally, SDG&E shall explain in its Tier 2 AL how/whether it has coordinated with other EPIC Administrators on this topic area.
SDG&E	4. Demonstrating Solutions for Inverter Integration Issues	SDG&E shall demonstrate how, in its implementation of this topic, it has considered what is lacking in the current standards and testing criteria that warrants more work on the operations and performance of smart inverters. Additionally, SDG&E shall explain in its Tier 2 AL how it will clearly quantify expected ratepayer benefits from operating savings and higher system reliability.
SDG&E	5. Integrated Distributed Energy Resources (IDER) Operational Flexibility	SDG&E shall demonstrate how, in its implementation of this topic, it clearly quantifies the potential benefits of SDG&E ratepayers managing their near real-time energy demand.
SDG&E	6. Commuter Train Electrification	This Research Topic Area is denied. SDG&E shall reallocate these funds and explain in its Tier 2 AL how the funds will be reallocated.

Administrator	Research Topic Area Title	Modifications, Requirements, and Directions to be included in the Tier 2 Advice Letter³⁰ and/or in Project Implementation
PG&E	1. Microgrid Enablement	PG&E shall demonstrate how, in its implementation of this topic, this is not duplicative of and informs PG&E's Remote Grid Program under PG&E's wildfire mitigation plan. Additionally, PG&E shall demonstrate how, in its implementation of, this is not duplicative of and informs the IOU's \$200 million Microgrid Incentive Program, approved by D.21-01-018.
PG&E	2. Long Duration Energy Storage	PG&E shall demonstrate, in its implementation of this topic, that its projects quantitatively define the terms "safe," "reliable," and "available" regarding the metrics and performance indicators titled "demonstration of safe and reliable operation of LDES systems" and "availability of standardized market models and integration methods for LDES."
PG&E	3. Integration of New Generation Technologies	PG&E shall demonstrate how, in its implementation of this topic, it clearly defines metrics for technology grid impact and interaction with infrastructure and identifies the use cases and specific grid integration functionalities that are being explored.
PG&E	4. Grid Sensing and Communication	PG&E shall demonstrate how, in its implementation of this topic, it clearly articulates the cybersecurity needs addressed, further innovation required, and desired results.
PG&E	5. Grid Scenario Planning	PG&E shall demonstrate how, in its implementation of this topic, it clearly articulates how each project supports equity. Additionally, PG&E shall consider how its platform could better coordinate decision making across the electric sector.
PG&E	6. Advanced Drone Applications	PG&E shall demonstrate how, in its implementation of this topic, it clearly identifies and reports on the use cases that are being explored.
PG&E	7. System Protection	PG&E shall demonstrate how, in its implementation of this topic, it has considered how new proposed protected technologies will be evaluated for correct operation under extreme weather conditions.
PG&E	8. Interconnection Enablement	PG&E shall demonstrate how, in its implementation of this topic, it quantifies and reports on the time currently required to connect new load and generation on capacity-constrained feeders versus non-capacity-constrained feeders.

Administrator	Research Topic Area Title	Modifications, Requirements, and Directions to be included in the Tier 2 Advice Letter³⁰ and/or in Project Implementation
PG&E	9. Electric Vehicle Charging and Integration Enablement	PG&E shall demonstrate how, in its implementation of this topic, this is not duplicative of existing CEC and commercial efforts. Additionally, PG&E shall consider why evaluating electrified PG&E service vehicles for mobile, plug-in emergency power provides value given existing MBESS technology. Finally, PG&E shall explain in its Tier 2 AL whether/how there is no conflict or duplication with other transportation electrification activities under D.22-08-024 and D.22-11-040.
PG&E	10. Improved Inspection Capabilities	PG&E shall demonstrate how, in its implementation of this topic, it has considered the value of expanding AI learning with the computer vision application programming interface (API) WALDO to distribution, rather than focusing on improvement and demonstration of success of WALDO on transmission through cost-benefit analysis.
PG&E	11. Pinpointing Fault Location	PG&E shall demonstrate how, in its implementation of this topic, it has considered procedures to efficiently screen novel technologies to be tested to avoid testing ones that are ineffective or serve only narrow use cases. Additionally, PG&E shall demonstrate how, in its implementation of this topic, it has considered incorporating in the screening process a preliminary cost-benefit analysis to help identify ratepayer benefit potential.
PG&E	12. Risk Modeling Improvements	PG&E shall demonstrate how, in its implementation of this topic, the metrics and performance indicators used to measure enterprise risk reduction are well-quantified to ensure that the project is an effective use of ratepayer funds.
PG&E	13. Crowdsourcing	PG&E shall demonstrate how, in its implementation of this topic, the metrics and performance indicators used to measure the accuracy and performance of machine learning to facilitate crowd sourced situational awareness are well-quantified to ensure that the project is an effective use of ratepayer funds.

Administrator	Research Topic Area Title	Modifications, Requirements, and Directions to be included in the Tier 2 Advice Letter³⁰ and/or in Project Implementation
PG&E	14. Climate and Nature-Positive Operations	The portion of this Research Topic Area request related to direct air carbon capture is denied. PG&E shall reallocate all funds intended for investigation and demonstration of direct air carbon capture and explain in its Tier 2 AL how the funds will be reallocated. Additionally, PG&E shall explain in its Tier 2 AL in detail how investment in demonstrating use of carbon credits related to vegetation management and biomass conversion would result in credits that are rigorously demonstrable as real, verified, enforceable, permanent, additional, and robust against leakage.
PG&E	15. Disaster Protection	PG&E shall explain in its Tier 2 AL how/whether this topic supports early alerts/communications with customers and particularly disadvantaged vulnerable communities during extreme events. Additionally, PG&E shall explain in its Tier 2 AL how safety performance metrics (SPM) and safety and operational metrics (SOM) are well-quantified to ensure that the project is an effective use of ratepayer funds. ³¹
PG&E	16. Granular Attributes for Environmental Commodity Tracking	PG&E shall demonstrate how, in its implementation of this topic, this will leverage and not be duplicative of the March 2022 Energy Tag Granular Certificate Scheme Standard and PJM's hourly, time-stamped certificates for PJM generation starting March 2023. Additionally, PG&E shall demonstrate how, in its implementation of this topic, estimates on emission reduction and ratepayer cost reduction expected from granular Renewable Energy Certificates are well quantified.

(END OF APPENDIX A)

³¹ Safety performance and safety and operational metrics refer to existing metrics provided in PGE's SPM report required by D. 19-04-020 and PGE's SOM report required by D.21-11-009